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## **ABSTRACT**

Systems and methods are provided for detecting and correcting bit errors in data structures. A data block and/or data structure is partitioned into adjacent bit pair domains, such that a single adjacent bit pair from each memory device is assigned to a given adjacent bit pair domain. The bits in the adjacent bit pair domain are processed by an error correction unit sequentially or in parallel, and then recombined to be written into memory or transmitted to a requestor.